# Algorithms, 9-5-08

**Lab 2: Extending the Quadratic class**: more practice with constructors and methods in Java.

First, start Eclipse, direct it to your personal workspace if necessary, and open the file Quadratic.java.

Second, THERE IS A LOGIC ERROR IN THE "ROOTS" METHOD (LAB 1). Fix it. (Parentheses misplaced to implement the quadratic formula).

Third, edit the Quadratic source code to add these methods. Please COMMENT each method as we did in lab 1. This will be "standard operating procedure."

1. An "add" method which takes a Quadratic parameter and adds it to "this" Quadratic. For example, if *f* represents  and *g* represents , after the call f.add(g) the value of *f* will be . (add is a "mutator"; it changes the value of the object on which it is called.) Return type is void.

2. A "multiply" method which multiplies "this" Quadratic by a parameter of type "double". For example, if *f* represents , after the call f.multiply(-0.5), the value of *f* will be . (multiply is another "mutator".)

3. A "discriminant" method (with no parameters) which returns the discriminant of "this" Quadratic (return type "double"). For example, if *f* represents , the call f.discriminant() returns the value -76.0.

4. A "distinctRoots" method (with no parameters) which returns "true" iff this Quadratic has two distinct real roots. Return type is boolean. Use a call to the discriminant method within the body of this method to shorten the code.

5. An "eval" method which takes a "double" parameter *x* and evaluates this Quadratic at the given value of *x*. Returns that function value as a "double".

6. A second constructor with two "double" parameters to specify the real roots (possibly equal) of the new Quadratic function. This constructor creates a Quadratic with *a* = 1 and roots as specified by the parameters.

Finally, go to vault.hanover.edu/~wahl, and open the **lab 2** link under Fall 2008, CS 225A. Copy the new main method, and paste it over the existing main method in Quadratic.java.

**Save and run. Show me that your code seems to be working correctly to get credit for this lab.**